"STUDY OF ANTI-ULCER POTENTIAL OF SOME MEDICINAL PLANTS FROM MARATHWADA REGION"

SECTION 01

INTRODUCTION

Ulcer is an open sore of the skin or mucus membrane characterized by sloughing of inflamed dead tissue. These are lesions on the surface of the skin or a mucous membrane characterized by a superficial loss of tissue. Ulcers are most common on the skin of the lower extremities and in the gastrointestinal tract, although they may be encountered at almost any site. There are many types of ulcer such as mouth ulcer, oesophagus ulcer, peptic ulcer, and genital ulcer. Of these peptic ulcer is seen among many people. The peptic ulcers are erosion of lining of stomach or the duodenum. The two most common types of peptic ulcer are called "gastric ulcer" and "duodenal ulcer." The name refers to the site of ulceration. A person may have both gastric and duodenal ulcers at the same time. Gastric ulcers are located in the stomach, characterized by pain; ulcers are common in older age group. Eating may increase pain rather than relieve pain. Other symptoms may include nausea, vomiting, and weight loss. Although patients with gastric ulcers have normal or diminished acid production, yet ulcers may occur even in complete absence of acid. Duodenal ulcers are found at the beginning of small intestine and are characterized by severe pain with burning sensation in upper abdomen that awakens patients from sleep. Generally, pain occurs when the stomach is empty and relieves after eating. A duodenal ulcer is more common in younger individuals and predominantly affects males. In the duodenum, ulcers may appear on both the anterior and posterior walls. In some cases, peptic ulcer can be life threatening with symptoms like bloody stool, severe abdominal pain, and cramps along with vomiting blood.

The Pathophysiology of peptic ulcer disease involves an imbalance between offensive (acid, pepsin, and Helicobacter pylori) and defensive factors (mucin, prostaglandin, bicarbonate, nitric oxide, and growth factors). Peptic ulcers are once believed to be caused by spicy food and stress; these have been found merely to be aggravating factors and the real causes have been found by research to include bacterial infection (Helicobacter pylori) or reaction to various medications, particularly NSAIDS (non steroidal anti-inflammatory drugs). Helicobacter pylori, NSAIDS drugs, emotional stress, alcohol abuse, and smoking are the principal etiological factors associated with peptic ulcer. The Gram-negative bacterium Helicobacter pylori remains present between the mucous layer and the gastric epithelium and is strategically designed to live within the aggressive environment of the stomach. Initially, Helicobacter pylori resides in the antrum but over time migrates toward the more proximal segments of the stomach.

Plants have always been a prototypical source of drugs and many of the formerly available drugs have been derived directly or indirectly from them. A wide array of plant derived active principles representing numerous chemical compounds has demonstrated activity consistent with their possible use in the treatment of several diseases. In Recent years, the use of ethno botanical information in medicinal plant research has gained considerable attention in segments of the scientific community. The use of plant parts and isolated phytochemicals for the prevention and treatment of various health ailments has been in practice from time immemorial.

Marathwada region of the state of Maharashtra is well known for its rich source of cultivated as well as wildly grown medicinal plants. The area comprises eight districts viz.,

Aurangabad, Beed, Hingoli, Jalna, Latur, Nanded, Osmanabad and Parbhani. The region falls between 17°35' and 20°40' N latitude and 74°40' and 78°15' E longitude. Marathwada region forms the part of the vast Deccan plateau of India and is one of the geographical division of Maharashtra State. In a quest to understand the botanical wealth of the region, V.N. Naik and associates have published the Flora of Marathwada and some articles in 1998-2009 and recorded 1719 species of flowering plants. The literature survey revealed that the local people of Marathwada region were using number of species of medicinally important plants belonging to more than 30 families. These are commonly occurring medicinally important plants used to treat various diseases like cold, fever, cough, diarrhoea, dysentery, skin diseases, toothache, indigestion, leprosy, and as an antidote for poisons and in wound healing.

SECTION 02

REVIEW OF LITERATURE AND DEVELOPMENT IN THE SUBJECT (PREVIOUS WORK DONE IN THE RELEVANT AREA)

- Sharath S.S., Preethy J. *et al* (2015) in their study unveal the anti-ulcer potential of ethanolic extract of convolvulus pluricaulis. By Pyloric ligation screening method in wister rats. They also estimated volume of gastric juice secreted, gastric free acidity, total acidity, total protein, pepsin mucin and pH. The results compared with ranitidine 50 mg/Kg. as standard drug.
- Karthik D., Varsha V. *et al* (2014) in their work evaluated gastro protective function of ethanolic extract of Pergularia daemia leaves on ethanol induced ulcer in albino rats. They also mentioned that, the anti-ulcer effect could be due to presence of saponin or sugar free polyphenols present in the extract.
- Anand M. Ingale, Vijaya Rajendran & Venkata Pinnelli (2014) in their research studied the anti ulcer activity of Grape (Vitis Vinifera) seed extract in wistar albino rats. Water immersion stress induced gastric ulcer model in wistar albino rat was used for study. Anti-ulcer activity was assessed by estimating gastric volume, pH, free and total acidity, ulcer number and its inhibition, gastric lesion, ulcer severity and ulcer index and compared with control group.
- Ladda R. G., Aradwad R.P. and Ambhore J.S. (2013) performed the survey of traditional medicinal plants of Marathwada region of Maharashtra and explore the rich wealth of medicinal plants of this area.
- Kalavani M. & Jegadeesan M., (2013) carried out study to investigate anti-ulcer activity of ethanolic extract of Madhuca longifolia flowers in pylorus ligated ulceration in albino rats. Inhibition of gastric fluid volume, free acidity, total acidity confirms the anti-ulcer potentioal of extract . Further they concluded that the anti-ulcer potential of the extract was may be attributed to presence of flavonoids (quercetin) alkaloids and tannis present in extract.
- Baral S.R., Swary S. *et al* (2013) studied the anti-ulcer activity of ethanolic extract of Dalbergia Sissoo leaves. The methodology involved screening for pylorus ligation and Indomethacin induced ulcer model in albino rats. The parameter studied includes mean ulcer index, percentage protection, gastric pH, protein, carbohydrate, pepsin, free and total acidity and ratio of total carbohydrate and protein (TC:PC) determination
- Shirisha Borgu and Subash V., (2012) in their research describe various causes of gastric ulceration. They further described that stress, alcohol consumption, uneven

food habits etc. are the prime causes of ulceration. Their research also describes the pathophysiology of gastric ulceration in detail.

- Ayyanar M. Ignacimuthus (2011) carried out the ethenobotanical survey of medicinal plants commonly used by tribals of Western Ghats, India and reveals the medicinal potential of number of medicinal plants of that region.
- N Venkat Rao, Kola Venu *et al* (2011) evaluated antiulcer activity of fruit of plant Momordica charantia. In their research they revealed the anti-ulcer activity of ethenolic and water extract of the fruit by studying Pylorus ligation, Aspirin land stress induced ulcer models in rats.
- Harshada Takawade, Vaishali Mute *et al* (2011) investigated anti-ulcer effect of hydroalcoholic and aqueous extracts of bark of Caesalpinia Pulcherrima against Aspirin induce ulceration in rats. Pylorus ligation model for protection against aspirin induced ulcer was studied. Volume of gastric content, pH and acidity were determined.
- Dashpute N.L. and Naikwade N.S. (2011) in their research evaluated anti-ulcer activity of methanolic extract of Abutilon indicum leaves on albino rats. Pylorus ligation and ethanol induced ulceration was studied. Ulcer index and percentage inhibition of ulceration was calculated.

SECTION 03

OBJECTIVES OF RESEARCH

In this modern era for primary health care, most of the world populations still uses herbal medicine because of its better cultural acceptability, better compatibility with the human body, and lesser side effects.

Peptic ulcer is one of the world's major gastrointestinal disorders and affecting 10% of the world population. About 19 out of 20 peptic ulcers are duodenal. An estimated 15000 deaths occur each year as a consequence of peptic ulcer. In the Indian pharmaceutical industry, antacids and antiulcer drugs share 6.2 billion rupees and occupy 4.3% of the market share.

Literature survey reveals that Marathwada region of Maharashtra State is blessed with a extremely great extent of availability of medicinal plants, but unfortunately very few of them has been explore for their anti-ulcer effect. Therefore we thought it worthwhile to design the present study with an objective **to explore medicinal potential i.e. anti-ulcer effect of some herbal plants from Marathwada region of Maharashtra**.

SECTION 04

METHODOLOGY TO BE ADDOPTED

1. Selection of plant species:

Marathwada region of Maharashtra state consists of different forests like Mahur, Kinwat, Sitakhandi, Gautala, Bhildary ghat, Ajantha forest etc. which are very rich source of a large number of medicinal plants species. For present study it is planned to target some unexplored plant species of the same region to evaluate their anti-ulcer potential. It is decided to select minimum two plant species for evaluation of their anti-ulcer potential.

2. **Collection, Identification and authentication of selected plant material :**

   Selected plant species will be collected from some of above mentioned regions followed by its identification and authentication from expert taxonomist followed by drying and powdering it.

3. **Extraction of powdered drug :**

   Suitable sized powder form of selected individual will be subjected for extraction. The choice of solvent and extraction method will be decided according to the nature of chemical constituents of selected plants.

4. **Phytochemical evaluation of the extract :**

   The extracts obtained suitable method of extraction will be tested for the presence of different phytoconstituents such as carbohydrates, alkaloids, glycosides, resins, tannins, steroids, flavanoids etc. by performing chemical tests for their identification.

5. **Evaluation of anti-ulcer activity:**

   Extracts will be evaluated for their anti-ulcer activity by studying it on suitable animal model. Different models available for the screening includes

   - Aspirin induced ulcers,
   - Ethanol induced ulcer,
   - Pylorus ligation induced ulcer,
   - Water immersion stressed induced ulcers,
   - Indomethacin induced ulcers,
   - Histamine induced ulcers,
   - Reserpine induced ulcers,
   - Serotonin induced ulcer,
   - Acetic acid induced ulcer,
   - Hydrochloric acid induced ulcer etc.

   Suitable model from above list will be chosen during actual study. Parameters such as estimation of **volume of gastric juice secretion, gastric free acidity, total acidity, total protein, pepsin mucin, pH, etc. followed by histopathological studies** will be evaluated to screen anti-ulcer potential of the extracts.

   6. Possible efforts will be taken for isolation and characterization of active components or its fraction from the extract showing maximum promising anti-ulcer effect.

SECTION 05

IMPORTANCE OF STUDY

Herbal medicine, as a major part of traditional medicine, has been used in medical practice since antiquity and is a common element of ayurvedic, homeopathic and naturopathic medicine. World Health Organization (WHO) notes that 74% of the plant derived medicines are used in modern medicine, in a way that their traditional modern application directly correlates with their traditional use as herbal medicines by native cultures. WHO estimates that 65% of the world's population uses traditional medicines as their primary form of health care and about 85% of traditional medicines involve the use of herbal preparations. The global market of herbal drugs at present is approximately $ 600 billion.

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The literature served revealed that the local people of Marathwada region were using number of species of medicinally important plants belonging to more than 30 families. These are commonly occurring medicinally important plants used to treat various diseases like cold, fever, cough, diarrhoea, dysentery, skin diseases, toothache, indigestion, leprosy, and as an antidote for poisons and in wound healing.

Marathwada region of Maharashtra state, although having very rich source of medicinal plants species, very few of them has been found to be explore for their anti ulcer potential. Therefore we thought it worthwhile to study on exploration of anti ulcer potential of some herbal plants from Marathwada region of Maharashtra.

SECTION 06

PROPOSED WORK PLAN

(Year Wise Plan of Work and Target to Achieve)

Present study is designed in such a way that it will come to a conclusive outcome within 03 years from the date of Allocation. The year wise plan includes**.**

YEAR 01

Literature survey, Field visit, Selection of Plants species, followed by its Collection, Authentication, Morphological and Microscopic evaluation, Drying, Powdering, Physical evaluation of powdered drug.

YEAR 02

Extraction of the powdered drug by suitable method of extraction, Phytochemical evaluation of extracts/ fractions by different qualitative and quantitative methods of evaluation (as per WHO guidelines). *In vitro* screening of different extracts for anti ulcer activity.

YEAR 03

In vivo screening of anti ulcer activity of different extracts on suitable animal model and by evaluating various parameters, Isolation and characterisation of active components present in the extract which will show maximum promising antiulcer effect, interpretation of data and thesis writing.

SECTION 07

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Date: - 27/04/2016

Place: - Nanded

Avinash K. Dhadwe
(Rsearch Scholar)
Nanded

Dr. Giridhar R. Shendarkar
(Research Guide)
CRPS, Nanded Pharmacy College, Nanded